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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Yasuhisa Tsujita et al.
Serial No. : 09/905,317
Filed : July 13, 2001
Title : TIRE CONDITION MONITORING APPARATUS

Art Unit : 2636
Examiner : Daniel Previl

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Commissioner for Patents
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REPLY TO ACTION OF MARCH 9, 2004

Claims 1 to 15 are pending in the application, of which claims 1, 9, and 15 are independent. Reconsideration of the application is respectfully requested in view of the applicants' remarks, below, which are preceded by a quotation of the related comments of the examiner in small, bold-faced type.

35 U.S.C. § 103(a) Rejections

Claims 1-4, 8-11, and 15 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Derbyshire et al. (U.S. 6,271,748; "Derbyshire") in view of Munch et al. (U.S. 6,580,364; "Munch").

Claim 1 recites a tire condition monitoring apparatus including "a controller, which judges whether or not the life of the battery is ending depending on the voltage-related value, wherein the judgment regarding the life of the battery is performed in accordance with the temperature in the tire."

The examiner concedes on pages 2-3 of the Office Action that Derbyshire "fails to explicitly disclose a controller, which judges whether or not the life of the battery is ending depending on the voltage-related value, wherein the judgment regarding the life of the battery is

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performed in accordance with the temperature in the tire” as required in claim 1. The examiner points to Munch as disclosing this feature of claim 1. Specifically, the examiner states on pages 7-8 of the Office Action that:

5. Applicant's arguments filed on January 7, 2004 have been fully considered but they are not persuasive.

According to Applicant's argument “neither Derbyshire nor Munch, along or in combination, discloses or suggests a feature of claim 1, i.e., a controller which judges whether or not the life of the battery is ending depending on the voltage-related value, wherein the judgment regarding the life of the battery is performed in accordance with the temperature in the tire.” The examiner respectfully disagrees with the Applicant because Munch clearly discloses that the controller at the sensor module providing a low battery condition when the tire has a low temperature or the tire pressure is above or less than a predetermined threshold (col. 8, lines 13-23).

The applicants respectfully disagree with the examiner's characterization of Munch. Referring to FIG. 2, Munch discloses a block diagram of the tire condition sensor module having a pressure sensor 78, a temperature sensor 84, and a battery voltage sensor 88. With respect to each of the sensors, Munch discloses:

The pressure sensor 78 is connected to the switch 76 and provides a tire pressure signal 80 to one input of a multiplexer circuit 82 indicative of the sensed tire pressure. (col. 5, lines 23-36).

A temperature sensor ... is connected to the switch 76 and to an input of the multiplexer circuit 82. The temperature sensor 84 provides a signal 86 to the multiplexer circuit 82 having an electrical characteristic indicative of the sensed temperature of the associated vehicle tire. (col. 5, lines 36-41).

A battery voltage sensor 88 is electrically connected between the internal power supply 26 and an input of the multiplexer circuit 82. The voltage sensor 88 samples the voltage of the power supply 26 upon the controller 72 activating the control switch 76. The voltage sensor 88 provides a battery voltage signal 90 to the multiplexer circuit 82 having an electrical characteristic indicative of the sensed voltage. (col. 5, lines 44-51).

The multiplexer circuit 82 provides a multiplexed serial output signal 92, indicative of the sensed parameters from each of the sensors 78, 84, and 88 ... The multiplexed data signal 92 is provided to an analog-to-digital converter (“A/D”) 94. The A/D converter 94 provides a digitized output signal 96 to a calibration function 98. (col. 5, lines 56-63).

The calibration function 98 provides a calibrated output signal 100 to another input of the controller 72. The signal 100 has a characteristic or value indicative of each of the sensed parameters, e.g., pressure, temperature, and battery voltage. (col. 6, lines 16-20).

Munch discloses that the controller 72 operates in one of two modes: (1) a normal operating mode in which a tire condition data signal is broadcast at random time intervals; and

(2) a sleep mode in which a tire condition data signal is broadcast only after one or more of the sensed tire or diagnostic conditions is determined to be below an associated predetermined threshold. (col. 7, lines 21-25). Specifically, Munch discloses:

... in the sleep mode, the controller 72 controls the transmitter 44 to broadcast the tire condition data signal only after first determining that the sensed tire pressure is below a predetermined threshold ... The broadcasting alternatively could be based on a determination that the sensed temperature is at or above some predetermined level or that the sensed battery voltage is below a voltage threshold. (col. 7, lines 26-34).

The portion of Munch cited by the examiner refers to a data packet transmitted by the transmitter 44, where the data packet has data bits that indicate the sensed tire condition information:

The tire condition information may, for example, indicate temperature, such as whether the sensed temperature is normal, invalid, a low temperature, or a high temperature. The tire condition information also might indicate whether the tire pressure is above or less than a predetermined threshold, such as a pressure alert status. Error bits also may be provided for indicating a low battery condition or other internal errors detected by the controller at the sensor module. (col. 8, lines 13-23).

The applicants respectfully disagree with the examiner's assertion that "Munch clearly discloses [in the cited portion] that the controller at the sensor module [provides] a low battery condition when the tire has a low temperature or the tire pressure is above or less than a predetermined threshold." (page 8 of Office Action). At most, the cited portion of Munch discloses providing four distinct pieces of tire condition information: (1) the sensed temperature as compared to predetermined temperature thresholds; (2) the sensed pressure as compared to predetermined pressure thresholds; (3) the sensed battery voltage as compared to predetermined voltage thresholds; and (4) error information indicative of a duration of an abnormal condition of the tire. No where does Munch disclose "a controller, which judges whether or not the life of the battery is ending depending on the voltage-related value, wherein the judgment regarding the life of the battery is performed in accordance with the temperature in the tire" as required in claim 1. Munch simply discloses judging the life of the battery by comparing the sensed battery voltage level with a predetermined voltage threshold (not sensed temperature or temperature threshold) to determine whether the battery voltage level is low.

For at least these reasons, claim 1 and its dependent claims are allowable over Derbyshire in view of Munch.

Should the examiner choose to maintain the rejection of claim 1 over Derbyshire in view of Munch, the applicants respectfully request that the examiner point to specific language in Munch which the examiner believes recites "a controller, which judges whether or not the life of the battery is ending depending on the voltage-related value, wherein the judgment regarding the life of the battery is performed in accordance with the temperature in the tire" as required in claim 1.

Independent claim 9 and its dependents are allowable for at least the same reasons given with respect to claim 1.

Independent claim 15 is allowable for at least the same reasons given with respect to claim 1.

Other Comments by the Examiner

On page 8 of the Office Action, the examiner states:

5. ... The examiner urges the Applicant to also read Pashayan, Jr. (US 6,252,498) on col. 6, lines 18-25; col. 4, lines 37-49.

The applicants have reviewed the cited portions of Pashayan and believe that Pashayan teaches away from the "judgment regarding the life of the battery is performed in accordance with the temperature in the tire" feature of claim 1. For example, col. 6, lines 18-21 of Pashayan states:

The microprocessor 86 could also be designed to detect a low voltage condition of the long-life battery 90 or to transit a different signal to the display unit 89 depending on the degree of under-inflation.

The applicants fail to understand how or where Pashayan discloses the features of claim 1.

Conclusion

It is believed that all of the pending claims have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement with or concession of that rejection, issue or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this

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paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

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Respectfully submitted,

Date: 6/8/04



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